REMARKS

Reconsideration of this application is respectfully requested.

The foregoing amendments to the claims are fully supported in the specification as originally filed. For example, paragraphs [0035] - [0046] describe examples of an enhanced atomic layer deposition (ALD) process designed to achieve a substantially maximum film deposition rate (measured in thickness per unit time). In particular, paragraphs [0038] - [0042] discuss an example in which a wafer is exposed to a dose of a first chemically reactive precursor that has a longer saturation time than a second chemically reactive precursor, where the dose of the first precursor exposure is an under-saturated dose, and further exposing the wafer to the second chemically reactive precursor, wherein the combination of first and second precursor doses result in a saturated deposition rate (measured in thickness per cycle) less than maximum possible saturated ALD deposition rate. New claims 40 - 45 are supported at [0043], [0053], [0064], [0070], [0074], [0078] and Figs. 5-7. No new matter is being added by any of these amendments.

As amended, the claims are patentable over both Park, US Patent Publication 2002/0160585, and Derderian, US Patent 6458416.

With respect to Park, the Office Action argues, "Since the dose that results in maximum growth rate as in the applicant's claimed process is disclosed as simply a function of the precursors utilized and the length of pulses, and Park teaches the claimed process steps (including equivalent times and process gases), Park would have inherently produced a dose sufficient to results [sic] in a film growth rate at a maximum value. As amended, however, claim 1 recites exposing a wafer to doses of two precursors, where the dose of the first precursor is an under-saturated dose, and the combination of respective doses of the first and second precursors results in a saturated deposition rate for the second precursor being less than a maximum possible saturated deposition rate therefor, where the saturated deposition rate is measured in film thickness per ALD cycle. Park does not address the under-saturated nature of the first precursor dose. Moreover, there is no discussion of a saturated deposition rate for the second precursor being less than a maximum possible saturated deposition rate therefor, as presently claimed.

Regarding the comment that Park would have inherently produced a dose sufficient to result in a maximum (film growth) value; to the contrary, Park consistently teaches away from

maximizing the film deposition rate (thickness/unit time). Park repeatedly refers to modulation of control parameters to maintain a deposition rate per cycle of 0.2 - 0.3 nm/cycle, (see, e.g., Park at [0052], [0055], [0057]) and then repeating the number of cycles to achieve the desired film thickness. If one were to follow such a recipe, one could not achieve the maximum film deposition rate. To the contrary, one would obtain no more than 17 Angstroms/min (see Park Table 3: 100A/350sec x 60sec/min ~17A/min). The comparable examples described in the present application achieve film deposition rates of 100 - 200A/min. These are quantitative differences that reflect the patentably distinct nature of the presently claimed process and indicate to one of ordinary skill in the art that Park is describing a materially distinct process for forming a film.

In short, the process described by Park lacks essential elements of the presently claimed enhanced ALD process and, therefore, cannot be said to anticipate the claimed process.

Derderian discusses techniques for improving the initiation of film growth on a substrate by improving localized gaps in otherwise uniform chemisroption of the substrate using 2nd or 3rd precursor(s) for a first few film layers. Such teachings do not address the use of an under-saturated dose of a first precursor, and the combination of respective doses of first and second precursors that result in a saturated deposition rate for the second precursor being less than a maximum possible saturated deposition rate therefor, as presently claimed. Indeed, Derderian is silent as to such issues and, therefore, cannot be said to anticipate the present claims. Just because the layer shown by Derderian in Fig. 1 and 5 have gaps does not imply that any of the precursor doses are under-saturated.

For at least the foregoing reasons, the rejections under 35 U.S.C. § 102 should be withdrawn. If there are any additional fees associated with this communication, please charge Deposit Account No.: 19-3140.

Respectfully submitted,

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